4. Methodology

The study was conducted at a university in Dubai, using undergraduate students enrolled in two sections of the same business ethics course. Participants were randomly assigned to a 3 (synchronicity: FTF, synchronous CMC, asynchronous CMC) by 3 (belongingness: acceptance, mild rejection, control) quasi-experimental design. Students were randomly assigned to three synchronicity groups (boundary conditions). Students within each boundary condition were randomly assigned to the three belongingness groups and a pro/con stance with a student with the opposite stance for constructive controversy.

Before the constructive controversy procedure, participants attended a 60-minute session to learn about the study, sign the consent forms, attend a technology training tutorial, receive instructions on the constructive controversy procedure, and complete the Eysenck Personality Questionnaire Brief Version [22]. Several days later, students received a belongingness manipulation message [23] and their randomly assigned partner. Participants also received an email about their group's stance (pro or con) and the pro or con article for the constructive controversy procedure. The articles focused on the ethics of whistleblowing, an appropriate topic for a business ethics course. After the constructive controversy exercise, participants filled out a post-procedure survey to measure social interdependence, sociocognitive conflict regulation, motivation, academic achievement, time spent, and their perceptions of technology. Participants then received a debriefing report.

4.1. Independent variables

Synchronicity and belongingness were categorical independent variables, and the two cultural dimensions measuring collectivism and uncertainty avoidance were covariates. The cultural dimension variables were based on scale items ranging from 1 ('Strongly Disagree') to 7 ('Strongly Agree').

The synchronous CMC condition relied primarily on real-time online communication. Communication involved real-time text, audio, or video-based discussion with partners. The asynchronous CMC condition mainly involved text-based communication with partners through emails and an online forum, which facilitated posting messages not occurring at the same time. For FTF, participants utilized class time to communicate.

The belongingness manipulation was administered using a procedure that placed participants in one of three states: control, acceptance, or mild rejection [24].

For the purposes of this study, only two cultural dimensions of Hofstede's six indices were examined: individualism-collectivism index and uncertainty avoidance index. Hofstede [17] created the indices using both theoretical reasoning and statistics. However, these values must be used at the country level, to avoid an ecological fallacy. Therefore, in order to use these cultural dimensions at the individual level, this study used a modified scale that measures Hofstede's cultural dimensions at the individual level. Yoo et. al [25] developed a new scale after collecting hundreds of items from Hofstede's work, as well as from non-Hofstede work that represented the core definitions of his dimensions. Through a series of surveys and multiple samples, the researchers refined the item pool to 26 reliable items that represent Hofstede's cultural dimensions at the individual level. This survey is called the CVSCALE. The CVSCALE [25] was used to measure the individualism-collectivism index (CO) for each participant (5 items; $\alpha = 0.66$). The higher the value, the more collectivist the individual. The CVSCALE [25] was also used to measure uncertainty avoidance (UAI) for each individual (5 items; $\alpha = 0.72$). The higher the value, the more the individual desires to avoid uncertainty.

4.2. Dependent variables

The six dependent variables: social interdependence, sociocognitive conflict regulation, motivation, academic achievement, time, and perceptions of technology. Except for achievement and time, the dependent variables were based on scale items ranging from 1 ('Not at All True' for motivation or 'Strongly Disagree' for all others) to 7 ('Completely True' for motivation or 'Strongly Agree' for all others).

Social interdependence was measured using three social interdependence subscales [26]: cooperation (5 items; $\alpha = 0.73$), competition (5 items; $\alpha = 0.82$), and individualism (5 items; $\alpha = 0.85$).

Sociocognitive conflict regulation was measured using two scales [7]: relational conflict regulation (2 items; $r = 0.55$), and epistemic conflict regulation (3 items; $\alpha = 0.69$). The lower reliability rates may be due to cultural differences, since the scales have only been used previously with French, Swiss and US samples.

Table 1. Demographics and Descriptive Statistics

	Face-to-Face			Synchronous CMC			Asynchronous CMC		
Variable (Maximum Value)	Acceptance	Mild Rejection	Control	Acceptance	Mild Rejection	Control	Acceptance	Mild Rejection	Control
Social Interdependence									
Cooperation (35)	28.8 (2.77)	21 (3.22)	22.6 (6.58)	27.71 (3.5)	27.71 (2.98)	22.33 (3.39)	23.71 (5.94)	25.17 (2.64)	27.71 (6.65)
Competition (35)	25.6 (4.62)	24 (6.36)	22.6 (6.58)	20.86 (3.29)	21 (7.9)	17.83 (4.12)	22.71 (4.92)	19.5 (8.6)	20.14 (498)
Individualism (35)	15.2 (4.49)	24.67 (4.23)	16.8 (5.81)	15.29 (5.15)	17.43 (6)	19.33 (4.93)	21.43 (6.21)	18 (6.63)	19.14 (8.11)
Sociocognitive Conflict Regulation									
Relational (14)	8.4 (2.3)	10 (2.76)	8 (2.55)	8.14 (1.77)	8.14 (2.04)	6.5 (2.17)	9.14 (1.21)	8.83 (1.83)	9.71 (2.87)
Epistemic (21)	18.6 (1.14)	16.5 (2.81)	16 (2.92)	14.43 (3.69)	16.86 (1.86)	16 (2.28)	16.86 (3.02)	16.17 (2.64)	18 (1.63)
Motivation									
Interest-value (98)	83.2 (8.5)	66.33 (6.59)	78 (8.63)	67.71 (8.65)	63.29 (20.26)	59.17 (25.81)	71.71 (9.84)	57.67 (18.61)	63.43 (22.16)
Academic Achievement									
Multiple Choice (5)	4.2 (1.79)	4.17 (1.6)	3.6 (1.14)	3.71 (1.89)	4.57 (0.79)	4.67 (0.52)	4 (1)	3 (2.19)	4.57 (0.79)
Critical Thinking (4)	3.5 (0.14)	3.43 (0.03)	3.62 (0.18)	3.23 (0.26)	3.42 (0.19)	3.48 (0.03)	3.71 (0.07)	3.63 (0.16)	3.58 (0.21)
Perceptions of Technology									
Attitude toward Technology (28)	25.4 (2.61)	21.67 (5.01)	18.8 (5.67)	21 (3.42)	25.14 (1.95)	17.5 (5.24)	20.57 (2.51)	22.33 (4.08)	24.86 (2.48)
Self-Efficacy with Technology (21)	17.8 (2.49)	17 (2.28)	14.6 (3.36)	14.57 (4.2)	16.14 (3.39)	13.17 (4.26)	14.29 (2.63)	12.83 (2.71)	17.57 (2.44)
Cultural Dimensions									
Collectivism (35)	27 (2.12)	26.67 (3.44)	26.2 (3.27)	26.57 (5.06)	26.71 (6.02)	22.5 (2.51)	24 (4.65)	24.5 (2.88)	25.14 (2.67)
Uncertainty Avoidance (35)	29.2 (3.83)	28.17 (3.13)	28.2 (3.19)	28.43 (5.19)	29.86 (3.63)	25.33 (3.88)	28.71 (3.9)	29.17 (4.22)	30 (3.65)
Time									
Actual Time Spent	4.63 (1.8)	4.17 (1.94)	4.2 (1.25)	6.07 (6.85)	5.33 (3.2)	4.58 (2.65)	4.57 (1.24)	4.79 (4.77)	4.93 (2.19)
Preferred Time Spent	6.63 (2.87)	3.42 (1.69)	6.8 (4.32)	5 (3.27)	4.17 (1.94)	5.17 (4.01)	6.5 (3.25)	3.38 (1.96)	4.71 (2.45)
Preferred minus Actual	2 (1.41)	-0.75 (1.33)	2.6 (3.15)	-1.07 (4.32)	-1 (2.31)	0.58 (1.8)	1.93 (2.52)	-1.42 (4.48)	-0.21 (1.8)
Group N	5	6	5	7	7	6	7	6	

Interest (7 items; $\alpha = 0.90$) and value (7 items; $\alpha = 0.92$) were measured using two subscales of the Intrinsic Motivation Inventory [27]. There was a strong positive correlation between interest and value ($r = 0.76$, $p < 0.001$), therefore the measures were aggregated to create a composite interest-value variable (14 items; $\alpha = 0.94$).

Knowledge and understanding of whistleblowing were measured using five multiple-choice items specifically written for the articles included in the procedure. Critical thinking in the final joint essay was assessed by two raters using a rubric form. Interrater reliability was low, ICC = 0.49. Looking at descriptive statistics for the two raters, Rater 1 tended to score essays lower on average, and had a slightly larger variation compared to Rater 2. The two sets of ratings are linearly related.

Time was measured using two questions from Saltarelli and Roseth's [3] study. Students were asked:

"*How much time did you spend on the constructive controversy project*, and *how much time would you have preferred to spend on the project*."

In our study, all participants had seven days to complete the constructive controversy procedure. Attitude toward technology (4 items, $\alpha_{pre} = 0.90$; $\alpha_{post} = 0.84$) and self-efficacy with technology (3 items, $\alpha_{pre} = 0.65$; $\alpha_{post} = 0.63$) were measured using two subscales from Unified Theory of Acceptance and Use of Technology [28]. Both scales were measured in the pre-procedure survey and in the post-procedure survey to determine if there were any changes during the constructive controversy project or if the preconceived attitudes of participants influenced the results.

5. Analysis of Findings

One participant switched synchronicity placement, from the randomly assigned FTF to asynchronous CMC, due to being out of the country during the experiment. Three students dropped out after randomization, which resulted in reorganizing several constructive controversy group memberships and pro/con stances. However, the random assignments of synchronicity and belongingness were not impacted. Two participants did not fill out the pre-procedure survey and 5 participants skipped at least 1 item on the pre-procedure survey. These participants were used in the final analysis; however, they were not included in any of the pre and post comparison analyses. Two participants did not have a final essay to be scored and were not included in the analyses for critical thinking. One participant was removed from the final analysis due to failure to complete the majority of the items on the post-procedure survey. In the final sample, there were 56 participants and 66% of them were male (3 missing responses), with a mean age of 21.08 years (SD = 1.71; range = 18-27). Table 1 provides participant descriptive statistics by boundary condition and belongingness.

5.2. Manipulation check

In the post-procedure survey, students were asked whether they were their partner's first choice, to examine whether their emotions varied according to the belongingness manipulation exercise. A Fisher's exact test of independence showed a statistically significant relationship between the belongingness manipulation and this question, $\chi^2(4, N=56) = 18.22$, $p < 0.001$.

Participants in the mild rejection condition were more likely to respond "no" and those in the control condition were more likely to respond, "I don't know". Unexpectedly, students in the acceptance condition were least likely to say "yes". Therefore, manipulation was successful for mild rejection and control, but unsuccessful for acceptance. As a result, interpretations for the different belongingness groups should be done with caution.

Table 2. Correlations Among Variables

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14
Social Interdependence													
1. Cooperation	0.07	-0.67**	-0.12	0.08	0.36**	0.09	-0.16	0.28*	0.12	.28*	0.24	0.03	-0.06
2. Competition		0.04	0.22	0.36**	0.44**	0.13	-0.08	0.08	0.21	0.07	0.34**	0.05	0.21
3. Individualism			0.15	0.04	-0.33*	0.03	0.14	-0.11	0.09	-0.13	0.08	0.05	0.07
Sociocognitive conflict regulation													
4. Relational				0.12	0.06	0.13	0.16	0.15	0.18	-0.03	0.10	-0.05	-0.13
5. Epistemic					0.22	0.21	0.21	0.13	0.17	0.11	0.49**	-0.15	-0.10
Motivation													
6. Interest-value						0.23	0.00	0.07	0.23	.3*	0.18	0.20	0.32*
Academic achievement													
7. Multiple choice							-0.19	0.18	0.21	0.16	0.07	.283*	0.11
Critical Thinking													
8. Average score								-0.16	-0.27*	-0.22	-0.04	-0.07	0.12
Perceptions of technology													
9. Attitude towards technology									0.63**	0.35**	0.28*	0.04	0.00
10. Self-efficacy with technology										0.33*	0.19	0.04	0.08
Cultural Variables													
11. Collectivism											0.18	0.11	0.07
12. Uncertainty Avoidance												-0.17	-0.09
Time													
13. Actual Time Spent													0.54**
14. Preferred Time													

* p-value < 0.05
** p-value < 0.01

5.3. Factorial analysis

Main effects, interaction effects, and covariate effects were analyzed using a 3 (synchronicity) x 3 (belongingness) MANCOVA, using CO and UAI as covariates. Post hoc tests were conducted when necessary, using Bonferroni multiple comparisons. A 3x3 ANCOVA, with CO and UAI as covariates was conducted when appropriate. The necessary assumptions were met for the MANCOVAs. Homogeneity of variance was violated for the three ANCOVAs. While violation of this assumption with nearly equal group sizes is of minimal concern, these results should be interpreted with some skepticism. To conserve space, only significant results are detailed. Table 2 shows correlations between continuous variables.

5.3.1. Cultural variables - CO was correlated with cooperation ($r = 0.28$, $p < 0.05$), interest-value motivation ($r = 0.3$, $p < 0.05$), attitude towards technology (post) ($r = 0.35$, $p < 0.01$), and self-efficacy with technology (post) ($r = 0.33$, $p < 0.05$). UAI was correlated with competition ($r = 0.34$, $p < 0.01$), epistemic conflict regulation ($r = 0.49$, $p < 0.01$), and attitude towards technology (post) ($r = 0.28$, $p < 0.05$).

For each ANCOVA and MANCOVA conducted, one of the assumptions is that there is no group by covariate interaction. This homogeneity of regression slopes suggests that the linear relationship between the outcome variable and cultural dimension is consistent across belongingness groups and synchronicity. This assumption was met for each ANCOVA or MANCOVA performed; thus, the cultural dimension effects are consistent across synchronicity and belongingness groups.

5.3.2. Social interdependence - Cooperation was correlated with individualism ($r = -0.67$, $p < 0.01$). MANCOVA results showed a statistically significant multivariate omnibus for UAI (Wilk's $\lambda = 0.76$), $F(3,47) = 4.94$, $p < 0.01$, partial $\eta^2 = 0.24$ and for CO (Wilk's $\lambda = 0.80$), $F(3,47) = 3.87$, $p < 0.02$, partial $\eta^2 = 0.2$. The between-subjects tests for UAI were statistically significant for competition, $F(1, 49) = 8.34$,

$p < 0.01$, partial $\eta^2 = 0.15$. The parameter estimate for UAI and competition is $\beta = 0.37$, $p < 0.01$, showing a positive relationship between the two variables, controlling for CO and across synchronicity and belongingness groups. The between-subjects tests for CO were statistically significant for cooperation, $F(1, 49) = 8.9$, $p < 0.01$, partial $\eta^2 = 0.15$. The parameter estimate for CO and cooperation is $\beta = 0.39$, $p < 0.01$, showing a positive relationship between the two variables, controlling for UAI and across synchronicity and belongingness groups. The between-subjects tests for synchronicity were statistically significant for competition, $F(2, 49) = 3.43$, $p = 0.04$, partial $\eta^2 = 0.12$. The parameter estimates for competition and FTF is $\beta = 0.71$, $p = 0.03$, suggesting that when controlling for both cultural dimensions and across belongingness groups, FTF increases competition more than SCMC.

5.3.3. Sociocognitive conflict regulation - Epistemic conflict regulation correlated with competition ($r = 0.36$, $p < 0.01$). MANCOVA results showed a statistically significant multivariate omnibus for UAI (Wilk's $\lambda = 0.76$), $F(2, 48) = 7.4$, $p < 0.01$, partial $\eta^2 = 0.24$. The between-subjects test for UAI was statistically significant for epistemic conflict regulation, $F(1, 49) = 15.1$, $p < 0.001$, partial $\eta^2 = 0.24$. The parameter estimates for UAI and epistemic conflict regulation is $\beta = 0.49$, $p < 0.001$, showing a positive relationship between the two variables, controlling for CO and across synchronicity and belongingness groups.

5.3.4. Motivation - Interest-value correlated with cooperation ($r = 0.36$, $p < 0.01$), competition ($r = 0.44$, $p < 0.01$), and individualism ($r = -0.33$, $p < 0.05$).

5.3.5. Academic achievement - ANCOVA results for critical thinking showed a statistically significant between-subjects effect for synchronicity, $F(2, 45) = 8.6$, $p = 0.001$, partial $\eta^2 = 0.28$. Post-hoc tests revealed significant mean differences between SCMC and ACMC ($p < 0.001$), and between SCMC and FTF ($p < 0.05$). For both mean differences, SCMC had lower critical thinking averages compared to the other boundary conditions.

5.3.6. Time spent - Two participants had unexpectedly high values for both time variables. The extreme nature of these outliers was evident when viewing the scatterplot and their presence in the sample notably impacted results and relationships. For the remainder of the analyses involving time, these outliers were removed from the sample.

Actual time and preferred time were correlated ($r = 0.54$, $p < 0.001$). Preferred time spent on the procedure correlated with interest-value ($r = 0.32$, $p < 0.05$). Actual time spent on the procedure correlated with multiple choice ($r = 0.28$, $p < 0.05$).

Due to several MANCOVA assumption violations and a smaller sample size, a MANCOVA did not seem statistically appropriate for the time variables.

However, when simply comparing the group means, SCMC spent more time on average (5.4 hrs), ACMC spent the second longest (average 4.8 hrs), and FTF spent the least amount of time on the constructive controversy (average 4.3 hrs). However, the preferred time spent on the project is reversed, with FTF preferring to have spent the most (5.4 hrs), ACMC preferring to spend the second most (average 4.9 hrs), and SCMC preferring to have spent the least (average 4.8 hrs).

Saltarelli found that ACMC spent more time on the constructive controversy than FTF and SCMC, but only SCMC would have preferred to spend more time on it. Our results are different, with SCMC spending more time than ACMC and FTF, with FTF preferring to spend more time on it. The mild rejection groups across synchronicity would have preferred to spend less time, while the acceptance groups for FTF and ACMC would have preferred to spend more time. For the control group, FTF and SCMC would have spent more time and the ACMC was slightly less.

5.3.7. Perceptions of technology - Attitude towards technology (pre) and self-efficacy with technology (pre) were correlated ($r = 0.56$, $p < 0.01$). Attitude towards technology (post) correlated with cooperation ($r = 0.28$, $p < 0.05$), attitude towards technology (pre) ($r = 0.62$, $p < 0.01$), and self-efficacy with technology (pre) ($r = 0.39$, $p < 0.01$). Self-efficacy with technology (post) correlated with the critical thinking average score ($r = -0.27$, $p < 0.05$). Self-efficacy with technology (post) correlated with attitude towards technology (pre) ($r = 0.38$, $p < 0.01$), self-efficacy with technology (pre) ($r = 0.52$, $p < 0.01$), and attitude towards technology (post) ($r = 0.63$, $p < 0.01$).

5.3.8. Differences between pre and post-test - Initial paired samples t-tests comparing pre and post survey results were not significant for attitude towards technology and self-efficacy with technology, suggesting that the pre-procedure perceptions of technology were statistically equal to the post-procedure perceptions of technology (there is a smaller sample here due to some participants failure to complete the pre-procedure survey). After creating a

difference variable (post minus pre), an ANOVA was conducted to determine if there were statistically significant changes in perceptions of technology between the synchronicity groups. This analysis was also not statistically significant, suggesting that the synchronicity condition did not result in any changes in perception of technology.

The difference between pre and post procedure values for self-efficacy with technology was moderately positively correlated with interest-value motivation ($r = .38$, $p < 0.01$), suggesting that those who were more motivated regarding the constructive controversy tended to increase in their self-efficacy with technology during the procedure, while those who were less motivated regarding the constructive controversy tended to remain about the same or decrease in their self-efficacy with technology throughout the procedure.

5.3.8. Belongingness and perceptions of technology - MANCOVA results showed a statistically significant multivariate omnibus for the interaction effect between belongingness and synchronicity (Wilk's $\lambda = 0.66$), $F(8, 88) = 2.51$, $p < 0.02$, partial $\eta^2 = 0.19$. The between-subjects tests for belongingness and synchronicity were statistically significant for self-efficacy with technology (post), $F(4, 45) = 2.57$, $p = 0.05$, partial $\eta^2 = 0.19$, and for attitude towards technology (post), $F(4, 45) = 4.1$, $p < 0.01$, partial $\eta^2 = 0.27$.

The parameter estimate for self-efficacy with technology and ACMC*mild rejection is $\beta = -1.831$, $p = 0.02$, suggesting that when controlling for both cultural dimensions, in ACMC, mild rejection resulted in a lower self-efficacy with technology adjusted mean compared to the control group. The parameter estimate for attitude towards technology and ACMC*mild rejection is $\beta = -1.86$, $p = 0.01$, suggesting that when controlling for both cultural dimensions, in ACMC, mild rejection resulted in a lower attitude towards technology adjusted mean compared to the control group.

5.3.10. Culture and perceptions of technology - The between-subjects tests for CO were also statistically significant for attitude towards technology (post), $F(1, 45) = 4.74$, $p < 0.04$, partial $\eta^2 = 0.1$. The parameter estimate for CO and attitude towards technology (post) is $\beta = 0.26$, $p < 0.04$, showing a positive relationship between the two variables, controlling for UAI and across synchronicity and belongingness groups.

6. Discussion

The effect of boundary conditions - Constructive controversy stimulates different psychological processes and academic achievement under various boundary conditions as evidenced by the larger competition mean for FTF and decreased critical thinking average for SCMC. Similar to Saltarelli and Roseth [3], we found a statistically significant synchronicity main effect for social interdependence, specifically for competition, and a main effect for critical thinking. They found that SCMC had a larger use-of-evidence mean than FTF and FTF had a larger integrative statement mean than ACMC. We found ACMC and FTF had a larger overall critical thinking mean than SCMC. ANCOVA results showed a statistically significant relationship between critical thinking and synchronicity, with a large partial effect size of 0.28. Prior research examined correlative relationships between competition and academic success [29].

The effects of belongingness - Mild rejection decreases attitude and self-efficacy towards the use of technology. We found interaction between synchronicity and belongingness for self-efficacy with technology and attitude towards technology. For both dependent variables, the control group in ACMC had a larger mean than the mild rejection group in ACMC. The MANCOVA for perceptions of technology resulted in a statistically significant interaction effect for belongingness and synchronicity. When controlling for both cultural dimensions in the ACMC boundary condition, mild rejection resulted in lower self-efficacy with technology and lower attitude towards technology compared to the control group with large partial effect sizes of 0.19 and 0.27, respectively. These findings build on prior research conducted by Saltarelli and Roseth [3] who found a statistically significant belongingness main effect for self-efficacy with technology, where acceptance resulted in a larger self-efficacy with technology mean than the control condition. Unexpectedly, results did not support our hypotheses regarding the effects of mild rejection across all boundary conditions nor was there evidence for the additive effects of satisfying student belongingness needs.

The effects of culture - Our findings showed that collectivism increased attitude towards technology (medium effect size of 0.1) and cooperation (large partial effect size of 0.15), and uncertainty avoidance increased competition (large partial effect size of 0.15) and epistemic behavior (large partial effect size 0.24).

These results support our hypothesis that cultural dimensions affect constructive controversy outcomes and generalize across boundary conditions.

Unlike our predictions, our sample of students who scored high on CO and UAI did not suffer the deleterious effects of ACMC. Instead, culture moderated the relationship between students' problem solving and collaboration skills and motivation. CO was positively correlated with cooperation, interest-value motivation, and attitude towards and self-efficacy towards technology. As such, higher levels of CO in our Arabic and Asian sample promoted positive psychological processes and motivation. The UAI cultural variable was positively correlated with competition, epistemic conflict regulation, and attitude towards technology. In other words, higher UAI in our sample promoted competition but surprisingly with an epistemic approach to conflict, while keeping a positive attitude towards technology.

7. Limitations

Our results were limited by the characteristics of the sample and by the operationalizations of the dependent variables. Our ability to find statistically significant relationships between the constructs of interest is dependent on the validity and reliability of our chosen measures, most of which are Western-based scales.

Challenges with technology due to the UAE government restrictions on digital networks could have affected our sample differently than those in the original US study conducted by Saltarelli and Roseth [3].

8. Conclusion

The results of this study have implications for both theory and practice. First, the difference in critical thinking in the SCMC boundary condition is cause for concern for online learning. One argument in favor of synchronous online learning revolves around an attempt to create a classroom-like environment to stimulate learning. However, at least in the present study, students in the SCMC boundary demonstrated the lowest levels of critical thinking. It could be that students in the SCMC condition in our study perceived the videoconferencing system as an extension of social media, rather than a learning tool, resulting in low scores on critical thinking. If this is a robust effect, and critical thinking is an outcome of interest in education, SCMC should be modified to incorporate more structure to avoid using the medium as a social activity and focus the time allocated to complete the learning objectives.

The differences in the effect of boundary conditions between the current study and Saltarelli's study [3] require explanation. Either one of our studies is flawed or, more likely, moderating variables not included in the studies explain the different results. Three important differences in the samples for the two studies exist which could explain the results, at least in part. For Saltarelli and Roseth [3], competition was higher in ACMC whereas it was higher in FTF in the present study. While Saltarelli and Roseth's [3] sample was majority female, the current sample was majority male. The greater presence of social cues in the FTF environment could stimulate competition in male participants and suppress competition in female participants. It should be noted, that the FTF activity used up the least amount of time to complete the learning outcomes.

Culture represents a second difference between the two samples. Saltarelli and Roseth's sample [3] was comprised primarily of US citizens while the present sample was comprised primarily of students from Asia and the Middle East. Asian and Arab cultures tend to be higher in collectivism and moderately lower uncertainty avoidance than the US. As expected, collectivism increased attitudes towards technology and cooperation. Interestingly UAI increased competition but with an epistemic approach to conflict resolution across boundary conditions and belongingness groups. Overall, the role of culture had a positive moderating effect in regulating motivation and behaviors in constructive controversy and certainly deserves additional study. It is worth highlighting that students in our current sample do not have experience in online courses (as the university does not offer distance education) compared to the US sample. In practice, the design of courses in cultures high in uncertainty avoidance should provide maximum access to information that enables students to create structure and understanding, thereby reducing uncertainty. Although more research is needed to understand the effects of these variables, the design of online courses should take gender, culture, and online experience into account.

The effect of mild rejection is interesting. In the FTF and SCMC environments, mild rejection produced no identifiable effects. However, in the ACMC

condition, students who experienced rejection reported more negative attitudes toward technology and reduced technology-related efficacy. Since the ACMC environment is entirely technology dependent, these adverse reactions to mild rejection could partially explain the high dropout rate commonly reported in online learning. Specifically, poor attitude toward, and reduced efficacy with, technology could mediate the relationship between perceived rejection and withdrawal from class. It is left to future research to confirm this theory. The fact that mild rejection did not have lasting effects on attitudes in the FTF and SCMC environments is easily explained. The social cues that occur when students interact in those two environments overwhelm the effect of artificially induced mild rejection and eliminate its effects.

For online, asynchronous learning, instructional designers need to identify mechanisms that prevent students from experiencing rejection and include activities that help address mild rejection. Such activities could embed interactions and scenarios between students that allow them to learn about team building, negotiation, and collaborative skills.

Our study demonstrates that constructive controversy can be used effectively in a well-designed and structured online learning. We also provide support for Saltarelli and Roseth's [3] claim that boundary conditions and mild rejection matter, though the direction of the differences was not always the same across the two studies. Finally, our study demonstrates that culture is an important determinant of student experiences in online learning and hints at the importance of gender and previous experience with non-traditional education in the design and conduct of computer-mediated instruction.

9. References

[1] Romano, J., Wallace, T.L., Helmick, I.J., Carey, L.M., and Adkins, L. (2005). Study Procrastination, Achievement, And Academic Motivation in Web-Based and Blended Distance Learning. The Internet and Higher Education, 8(4), 299–305.

[2] Johnson, D.W., Johnson, R.T., and Tjosvold, D. (2012). Constructive controversy: The Value of Intellectual Opposition. The Handbook of Conflict Resolution: Theory and Practice.

[3] Saltarelli, A.J., and Roseth, C.J. (2014). Effects of Synchronicity and Belongingness on Face-To-Face and Computer-Mediated Constructive Controversy. Journal of Educational Psychology, 106(4), 946–960.

[4] Johnson, D.W., and Johnson, R.T. (1989). Cooperation and Competition: Theory and Research. Edina, MN, US: Interaction Book Company.

[5] Johnson, D.W., and Johnson, R.T. (2009). Energizing Learning: The Instructional Power of Conflict. Educational Researcher, 38(1), 37–51.

[6] Darnon, C., Buchs, C., and Butera, F. (2002). Epistemic and Relational Conflicts in Sharing Identical Vs Complementary Information During Cooperative Learning. Swiss Journal of Psychology, 61(3), 139–151.

[7] Darnon, C., Muller, D., Schrager, S.M., Pannuzzo, N., and Butera, F. (2006). Mastery and Performance Goals Predict Epistemic and Relational Conflict Regulation. Journal of Educational Psychology, 98(4), 766–776.

[8] Brochu, M. (2017). Cyber Bullying: A Quantitative Study on The Perceptions and Experiences of Female Emirati University Students.

[9] Ryan, R.M., and Deci, E.L. (2000). Self-Determination Theory and The Facilitation of Intrinsic Motivation, Social Development, And Well-Being. American Psychologist, 55(1), 68–78.

[10] Martin, A.J., and Dowson, M. (2009). Interpersonal Relationships, Motivation, Engagement, And Achievement: Yields for Theory, Current Issues, And Educational Practice. Review of Educational Research, 79(1), 327–365.

[11] Juvonen, J., and Wentzel, K.R. (1996). Social Motivation: Understanding Children's School Adjustment. Cambridge University Press.

[12] Wallace, R.M. (2003). Online Learning in Higher Education: A Review of Research on Interactions Among Teachers and Students. Education, Communication and Information, 3(2), 241–280.

[13] Roseth, C.J., Saltarelli, A.J., and Glass, C.R. (2011). Effects of Face-To-Face and Computer-Mediated Constructive Controversy on Social Interdependence, Motivation, And Achievement. Journal of Educational Psychology, 103(4), 804–820.

[14] Al-Harthi, A.S. (2010). Learner Self-Regulation in Distance Education: A Cross-Cultural Study. The American Journal of Distance Education, 24(3), 135–150.

[15] Alsubaie, M.A. (2015). Examples of Current Issues in The Multi-Cultural Classroom. Journal of Education and Practice, 6(10), 86–89.

[16] King, E.W. (2002). Ethnicity. In D. L. Levinson, P. W. Cookson, Jr., and A. R. Sadowski (Eds.), Education and Sociology: An Encyclopedia (pp. 247-253). New York: Routledge Falmer.

[17] Hofstede, G. (2001). Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations, 2nd ed. Sage, Thousand Oaks, CA.

[18] Sheldon, K.M., Elliot, A.J., Kim, Y., and Kasser, T. (2001). What Is Satisfying About Satisfying Events? Testing 10 Candidate Psychological Needs. Journal of Personality and Social Psychology, 80(2), 325–339.

[19] Khattab, A. (2015). How Arab Executives Learn. Michigan State University.

[20] Nisbett, R. (2004). The Geography of Thought: How Asians And Westerners Think Differently...and Why. Simon and Schuster.

[21] Deutsch, M., Coleman, P.T., and Marcus, E. (2011). The Handbook of Conflict Resolution: Theory and Practice. John Wiley and Sons.

[22] Sato, T. (2005). The Eysenck Personality Questionnaire Brief Version: Factor Structure and Reliability. The Journal of Psychology, 139(6), 545–552.

[23] Twenge, J. M., Baumeister, R. F., Tice, D. M., and Stucke, T. S. (2001). If You Can't Join Them, Beat Them: Effects of Social Exclusion on Aggressive Behavior. Journal of Personality and Social Psychology, 81(6), 1058–1069.

[24] Romero-Canyas, R., Downey, G., Reddy, K.S., Rodriguez, S., Cavanaugh, T.J., and Pelayo, R. (2010). Paying to Belong: When Does Rejection Trigger Ingratiation? Journal of Personality and Social Psychology, 99(5), 802–823.

[25] Yoo, B., Donthu, N., and Lenartowicz, T. (2011). Measuring Hofstede's Five Dimensions of Cultural Values at The Individual Level: Development and Validation of CVSCALE. Journal of International Consumer Marketing, 23(3-4), 193–210.

[26] Johnson, D.W., and Norem-Hebeisen, A. (1977). Attitudes Toward Interdependence Among Persons and Psychological Health. Psychological Reports, 40(3), 843–850.

[27] Ryan, R.M. (1982). Control and Information in The Intrapersonal Sphere: An Extension of Cognitive Evaluation Theory. Journal of Personality and Social Psychology, 43(3), 450–461.

[28] Venkatesh, V., Morris, M., Davis, G., and Davis, F. (2003). User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, 27(3), 425-478.

[29] Wentzel, K.R. (1999). Social-Motivational Processes and Interpersonal Relationships: Implications for Understanding Motivation at School. Journal of Educational Psychology, 91(1), 76–97.

